FIG.1

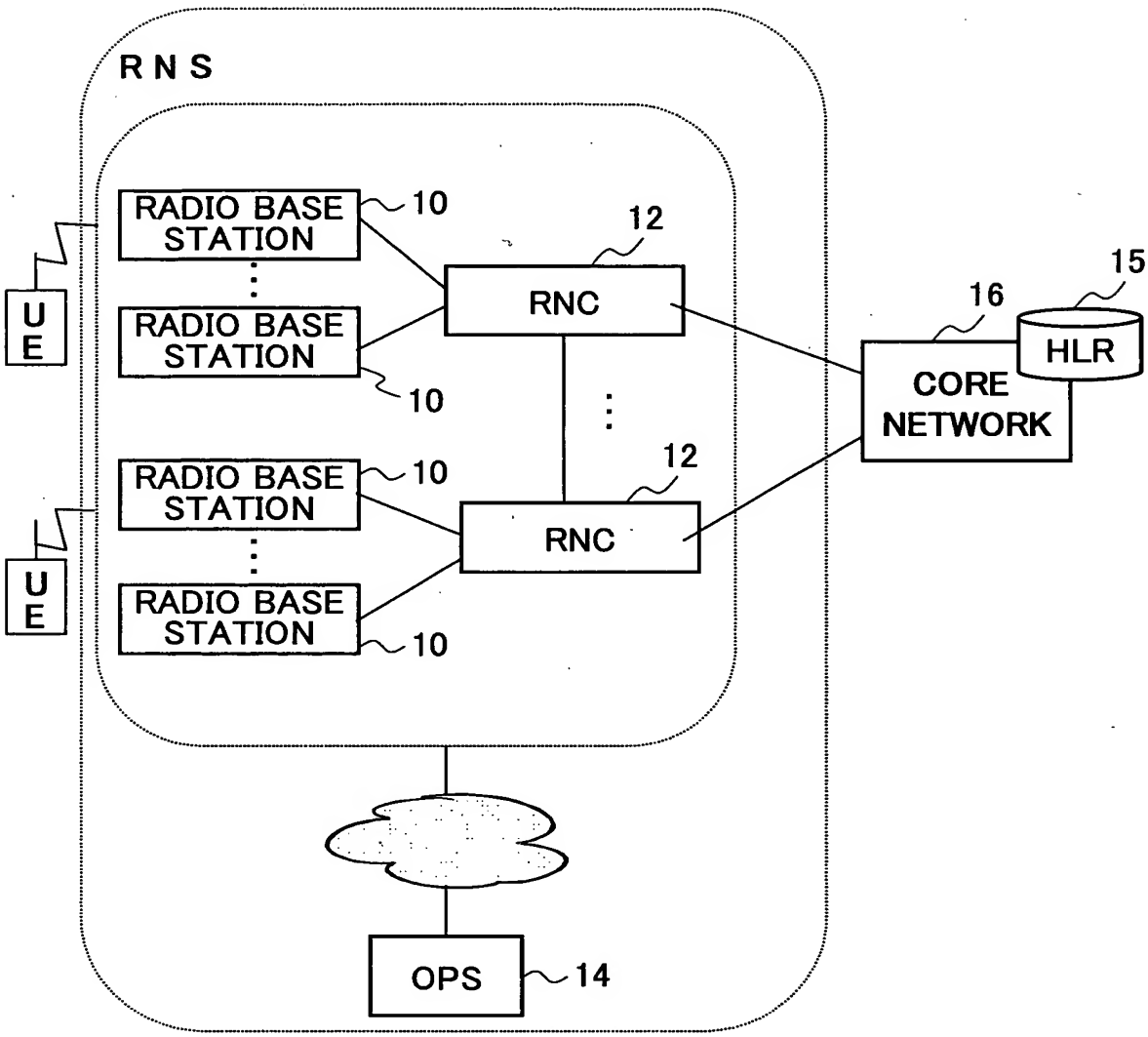

R N S
RADIO BASE STATION
10
RADIO BASE STATION
10
12
RNC
15
16
HLR
CORE NETWORK
U E
RADIO BASE STATION
10
RADIO BASE STATION
10
12
RNC
U E
OPS
14

FIG.2

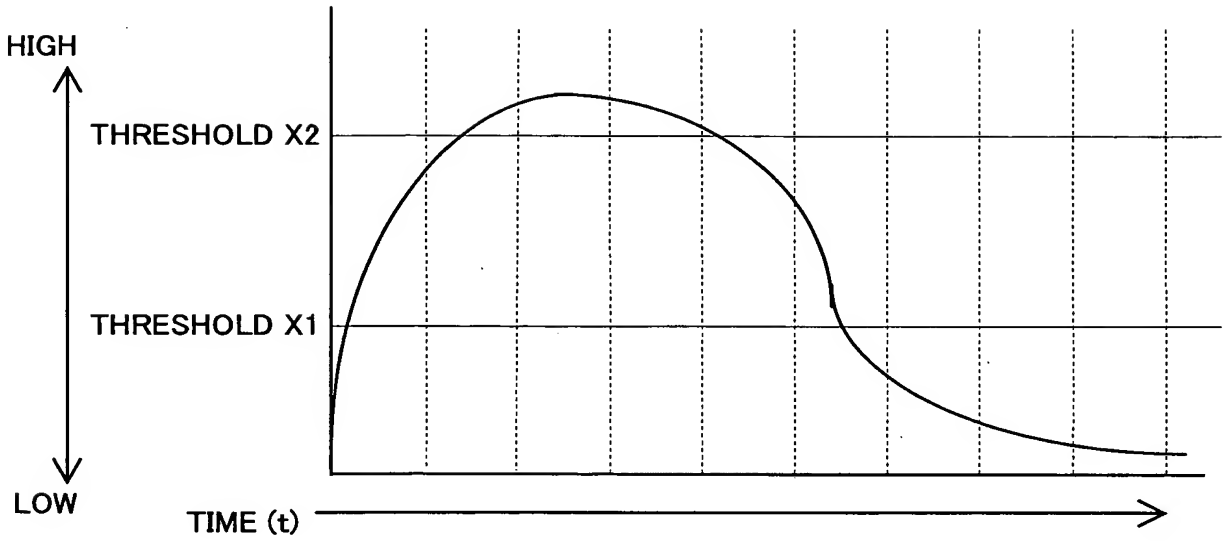

HIGH
THRESHOLD X2
THRESHOLD X1
LOW
TIME (t)

FIG.3

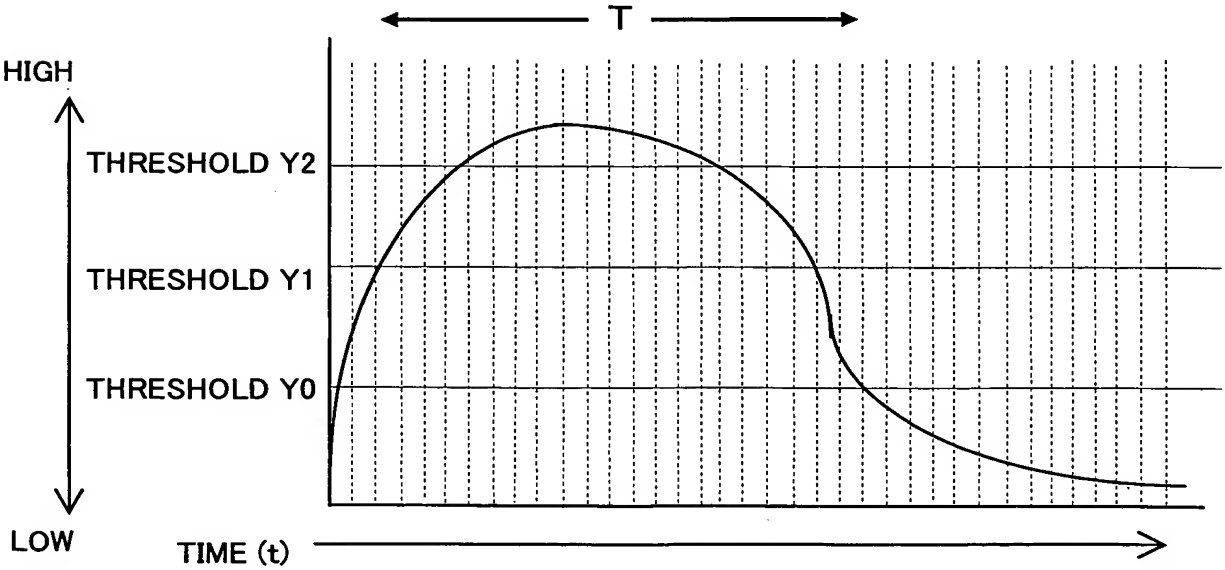

T
HIGH
THRESHOLD Y2
THRESHOLD Y1
THRESHOLD Y0
LOW
TIME (t)

FIG.4

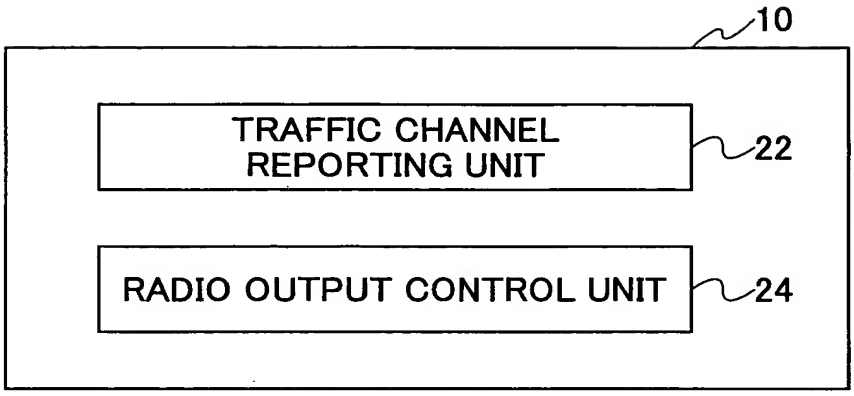

10
TRAFFIC CHANNEL REPORTING UNIT
22
RADIO OUTPUT CONTROL UNIT
24

FIG.5

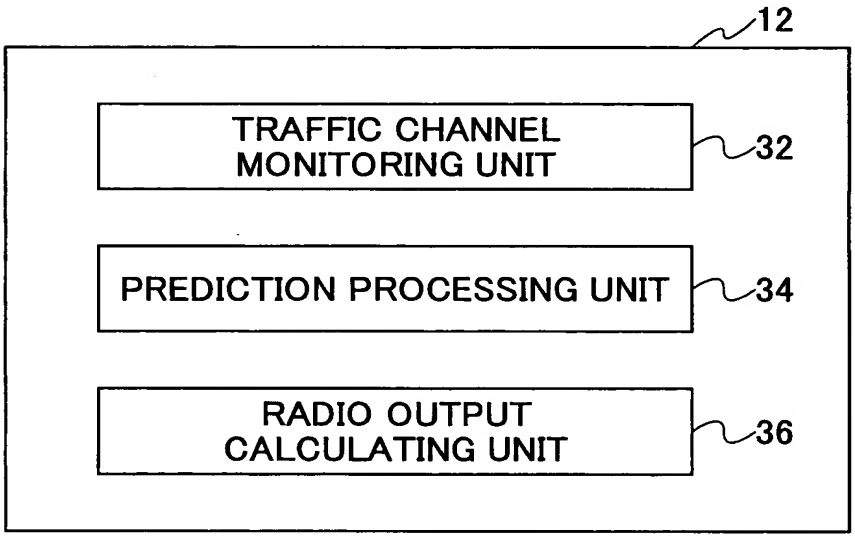

12
TRAFFIC CHANNEL MONITORING UNIT
32
PREDICTION PROCESSING UNIT
34
RADIO OUTPUT CALCULATING UNIT
36

FIG.6

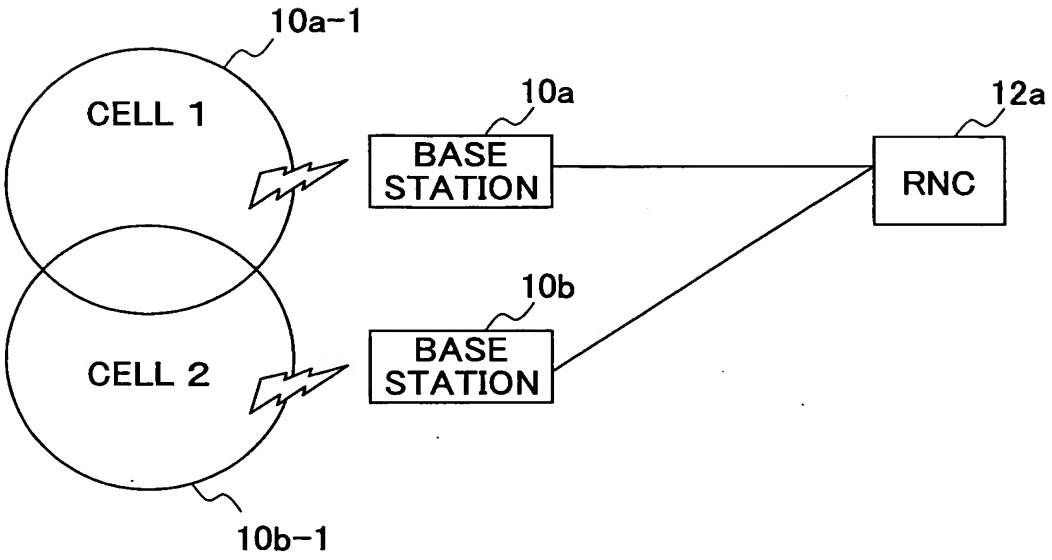

10a-1
CELL 1
10a
BASE STATION
12a
RNC
10b
CELL 2
BASE STATION
10b-1

FIG.7

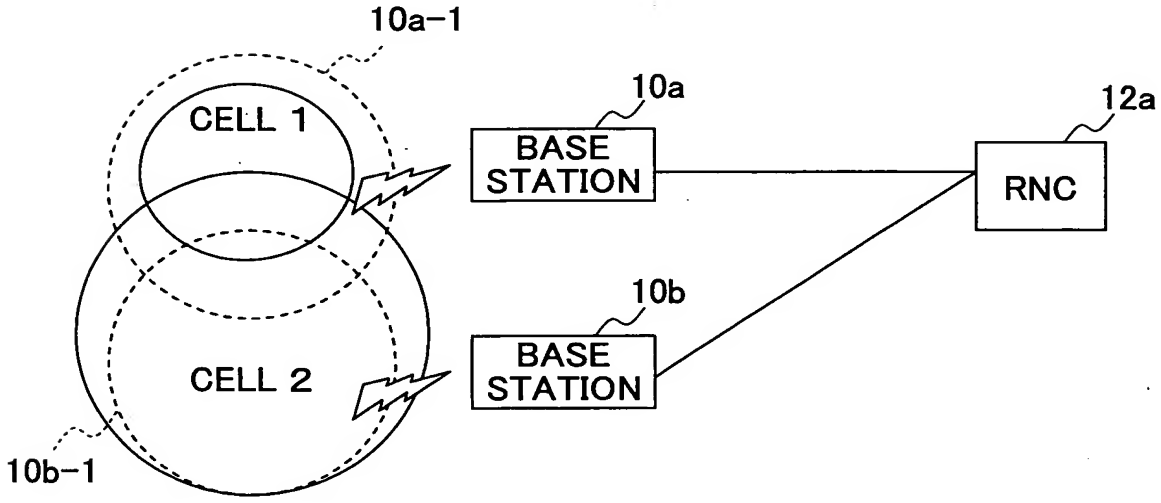

10a-1
CELL 1
10a
BASE STATION
12a
RNC
10b
CELL 2
BASE STATION
10b-1

FIG.8

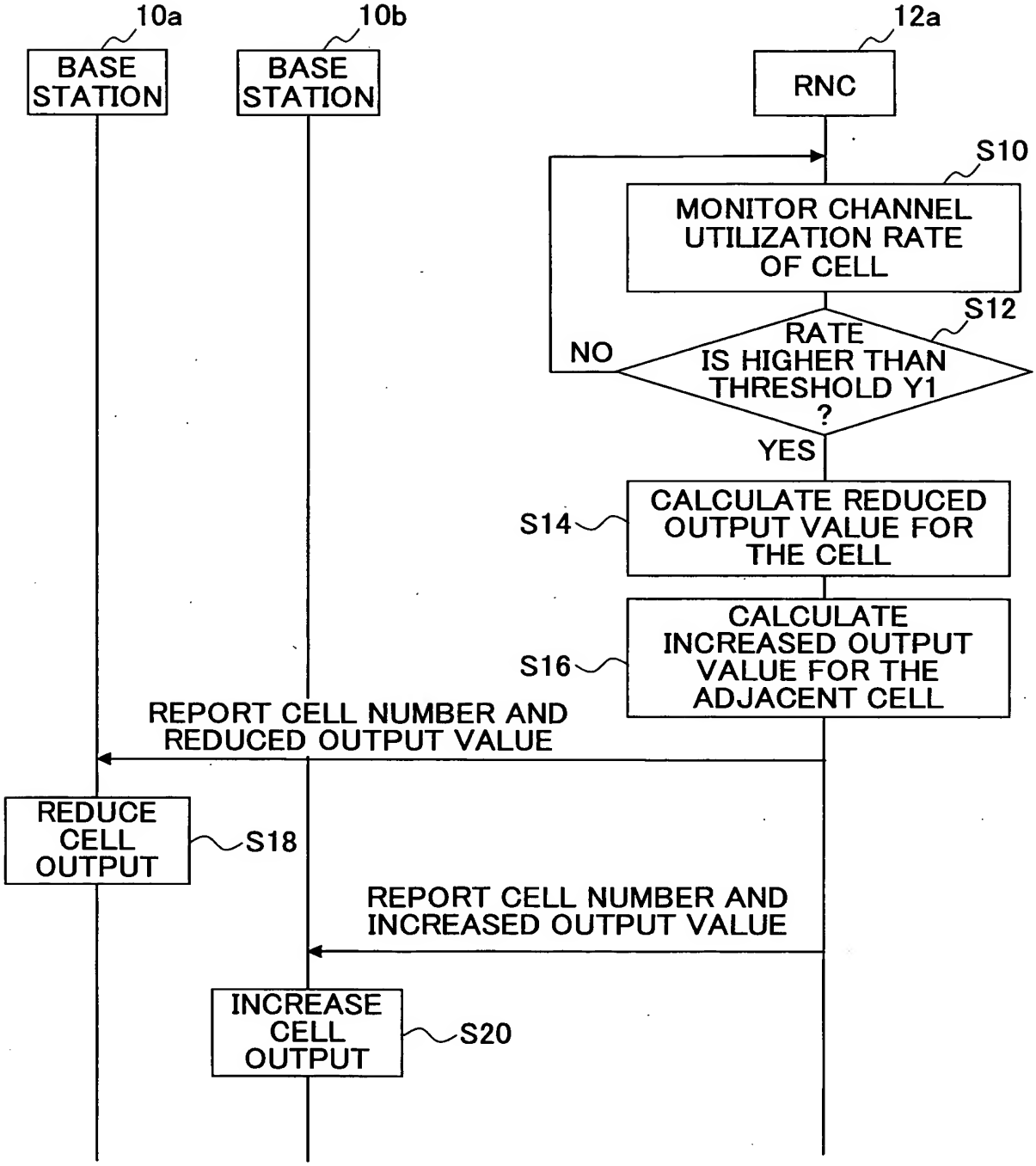

10a
BASE STATION
10b
BASE STATION
12a
RNC
S10
MONITOR CHANNEL UTILIZATION RATE OF CELL
S12
RATE IS HIGHER THAN THRESHOLD Y1 ?
NO
YES
S14
CALCULATE REDUCED OUTPUT VALUE FOR THE CELL
S16
CALCULATE INCREASED OUTPUT VALUE FOR THE ADJACENT CELL
REPORT CELL NUMBER AND REDUCED OUTPUT VALUE
REDUCE CELL OUTPUT
S18
REPORT CELL NUMBER AND INCREASED OUTPUT VALUE
INCREASE CELL OUTPUT
S20

FIG.9

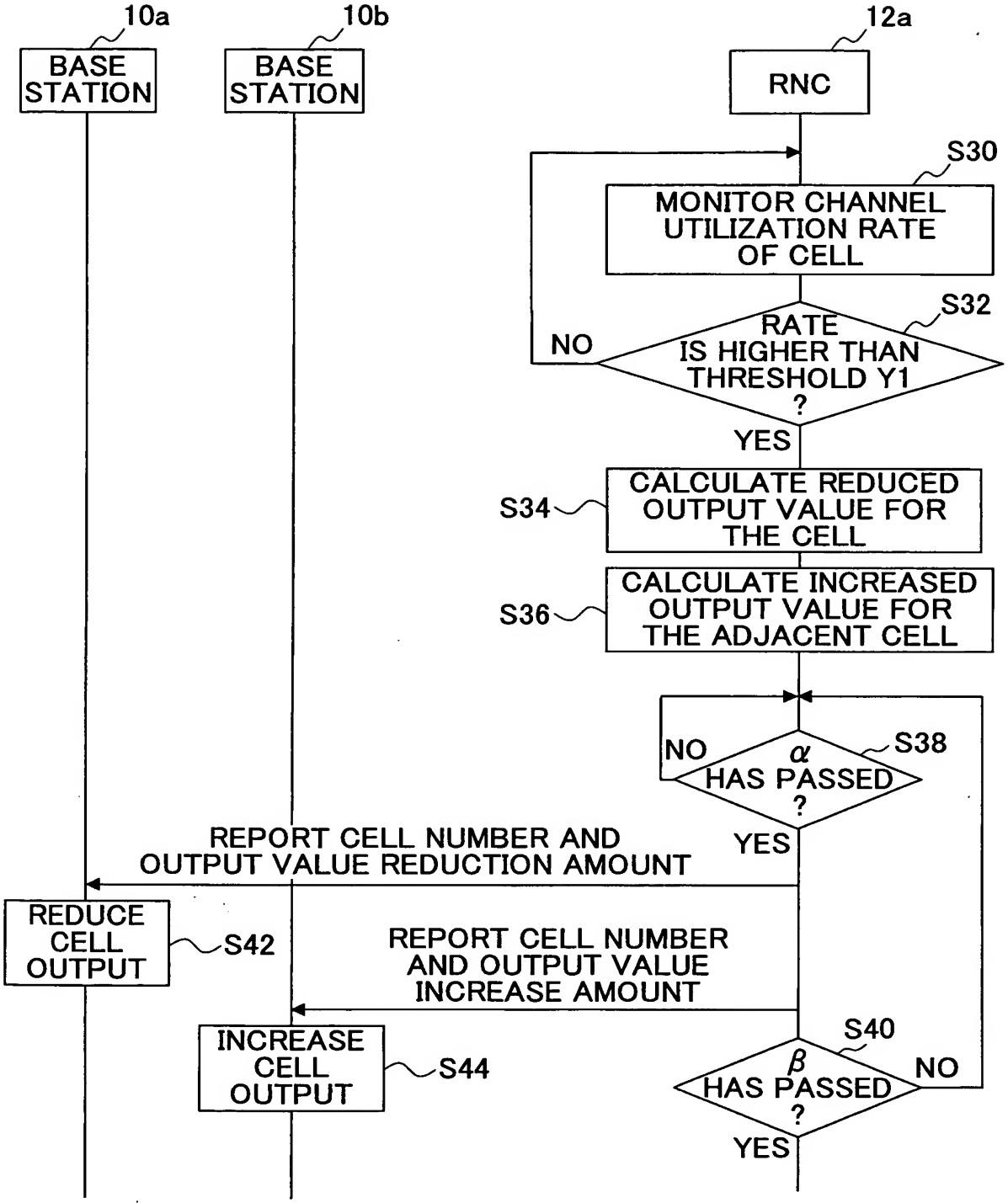

10a
BASE STATION
10b
BASE STATION
12a
RNC
S30
MONITOR CHANNEL UTILIZATION RATE OF CELL
S32
RATE IS HIGHER THAN THRESHOLD Y1 ?
NO
YES
S34
CALCULATE REDUCED OUTPUT VALUE FOR THE CELL
S36
CALCULATE INCREASED OUTPUT VALUE FOR THE ADJACENT CELL
NO
α HAS PASSED ?
S38
YES
REPORT CELL NUMBER AND OUTPUT VALUE REDUCTION AMOUNT
REDUCE CELL OUTPUT
S42
REPORT CELL NUMBER AND OUTPUT VALUE INCREASE AMOUNT
INCREASE CELL OUTPUT
S44
S40
β HAS PASSED ?
NO
YES

FIG.10

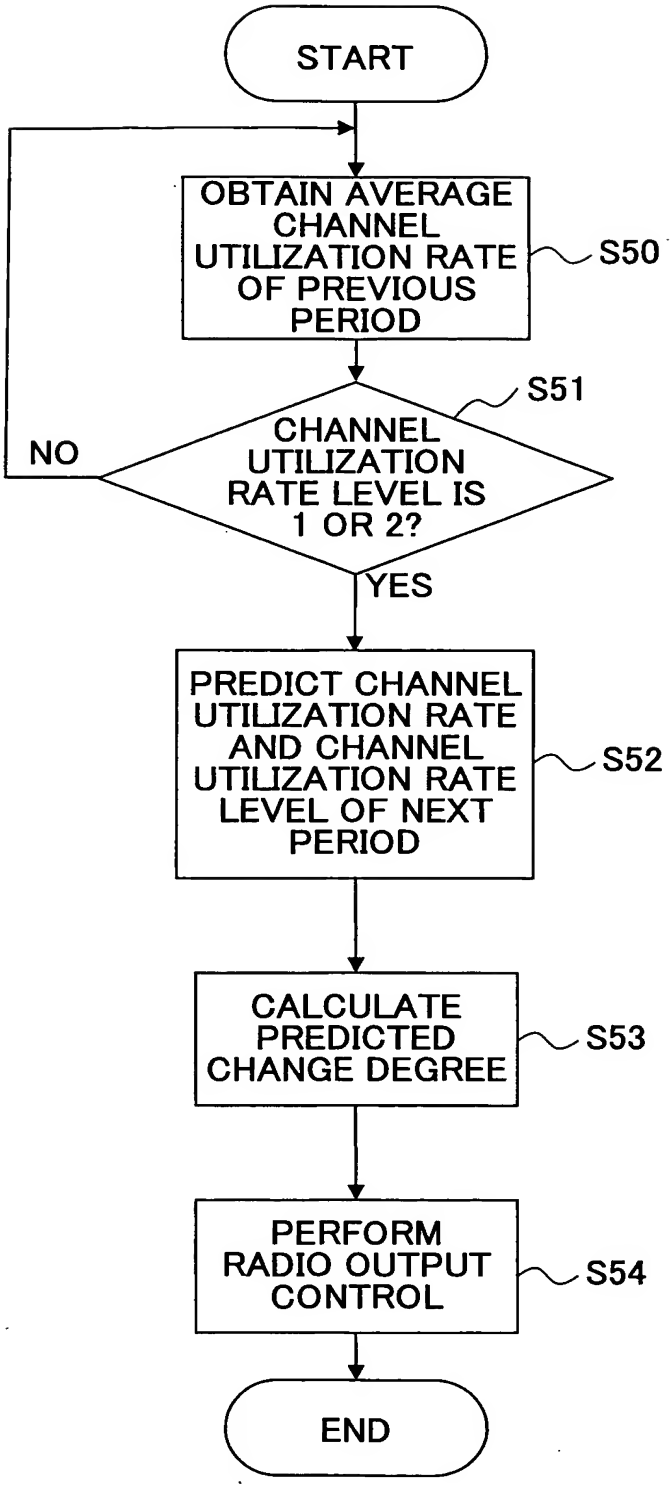

START
OBTAIN AVERAGE CHANNEL UTILIZATION RATE OF PREVIOUS PERIOD
S50
S51
CHANNEL UTILIZATION RATE LEVEL IS 1 OR 2?
NO
YES
PREDICT CHANNEL UTILIZATION RATE AND CHANNEL UTILIZATION RATE LEVEL OF NEXT PERIOD
S52
CALCULATE PREDICTED CHANGE DEGREE
S53
PERFORM RADIO OUTPUT CONTROL
S54
END

FIG.11

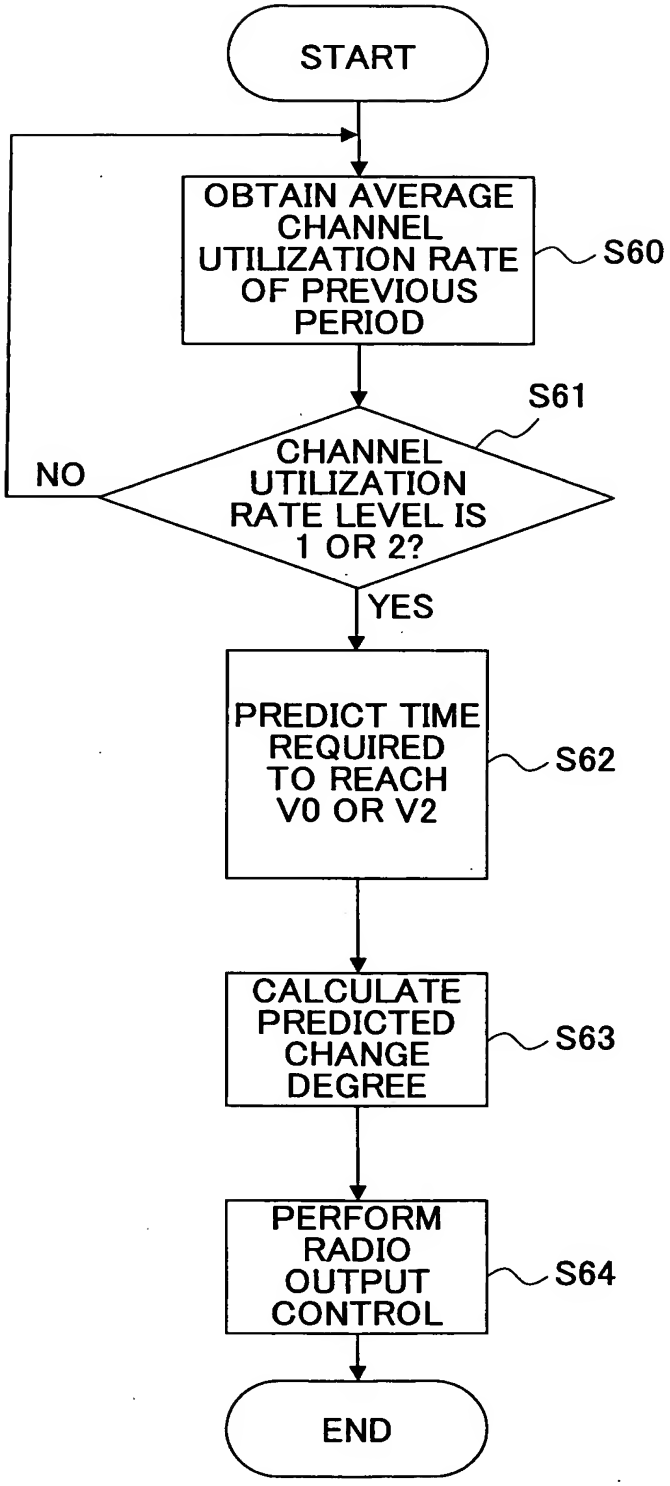

START
OBTAIN AVERAGE CHANNEL UTILIZATION RATE OF PREVIOUS PERIOD
S60
S61
CHANNEL UTILIZATION RATE LEVEL IS 1 OR 2?
NO
YES
PREDICT TIME REQUIRED TO REACH V0 OR V2
S62
CALCULATE PREDICTED CHANGE DEGREE
S63
PERFORM RADIO OUTPUT CONTROL
S64
END

FIG.12

CELL NO.	ADJACENT CELL INFO (STATION DATA)	
	THE NUMBER OF ADJACENT CELLS	ADJACENT CELL NUMBER LIST
1	3	2, 3, 4
2	4	1, 4, 5, 6
3	4	1, 4, 6, 7
4	6	1, 2, 3, 5, 7, 8
5	5	2, 4, 6, 8, 9
6	4	2, 5, 9, 10
7	6	3, 4, 8, 11, 16, 17
8	6	4, 5, 7, 9, 11, 12
9	6	5, 6, 8, 10, 12, 13
10	4	6, 9, 13, 21
11	6	7, 8, 12, 14, 17, 18
12	6	8, 9, 11, 13, 14, 15
:	:	:

FIG.13

CELL NO.	CELL TRAFFIC INFO		
	PREDICTED LEVEL	PREDICTED CHANGE DEGREE	OUTPUT VALUE
1	1	+1	0
2	0	0	0
3	0	0	0
4	1	+1	0
5	0	0	0
6	0	0	0
7	1	+1	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	1	0	0
:	:	:	:

FIG.14

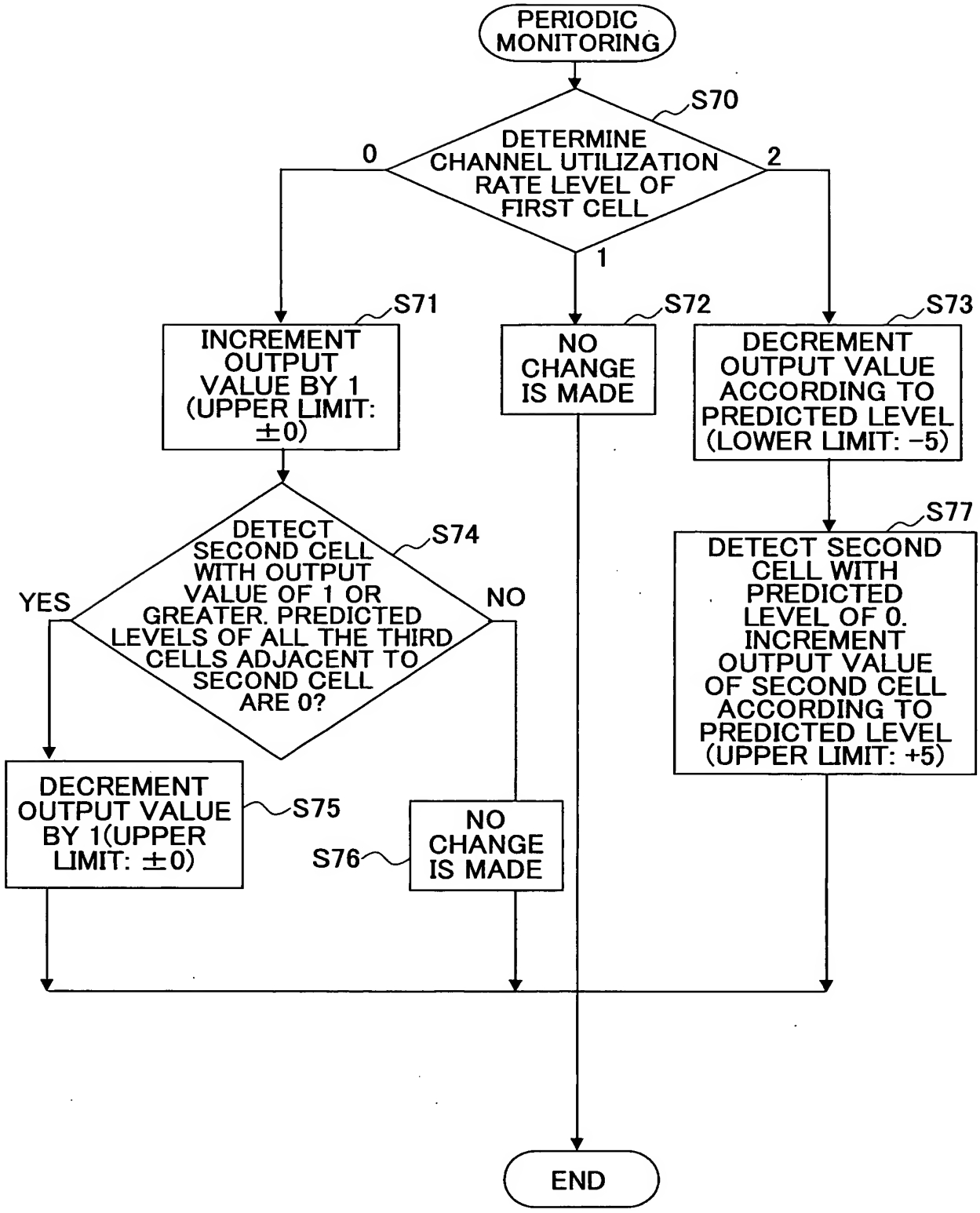

PERIODIC MONITORING
S70
DETERMINE CHANNEL UTILIZATION RATE LEVEL OF FIRST CELL
0
1
2
S71
INCREMENT OUTPUT VALUE BY 1 (UPPER LIMIT: ±0)
S72
NO CHANGE IS MADE
S73
DECREMENT OUTPUT VALUE ACCORDING TO PREDICTED LEVEL (LOWER LIMIT: −5)
S74
DETECT SECOND CELL WITH OUTPUT VALUE OF 1 OR GREATER. PREDICTED LEVELS OF ALL THE THIRD CELLS ADJACENT TO SECOND CELL ARE 0?
YES
NO
S77
DETECT SECOND CELL WITH PREDICTED LEVEL OF 0. INCREMENT OUTPUT VALUE OF SECOND CELL ACCORDING TO PREDICTED LEVEL (UPPER LIMIT: +5)
DECREMENT OUTPUT VALUE BY 1(UPPER LIMIT: ±0)
S75
S76
NO CHANGE IS MADE
END

FIG.15

CELL NO.	CELL TRAFFIC INFO		
	PRESENT LEVEL	PREDICTED CHANGE DEGREE	OUTPUT VALUE
1	1	+1	0
2	0	0	0
3	0	0	0
4	1	+1	0
5	0	0	0
6	0	0	0
7	1	+1	0
8	0	0	0
9	0	0	0
10	0	0	0
11	0	0	0
12	1	0	0
:	:	:	:

FIG.16

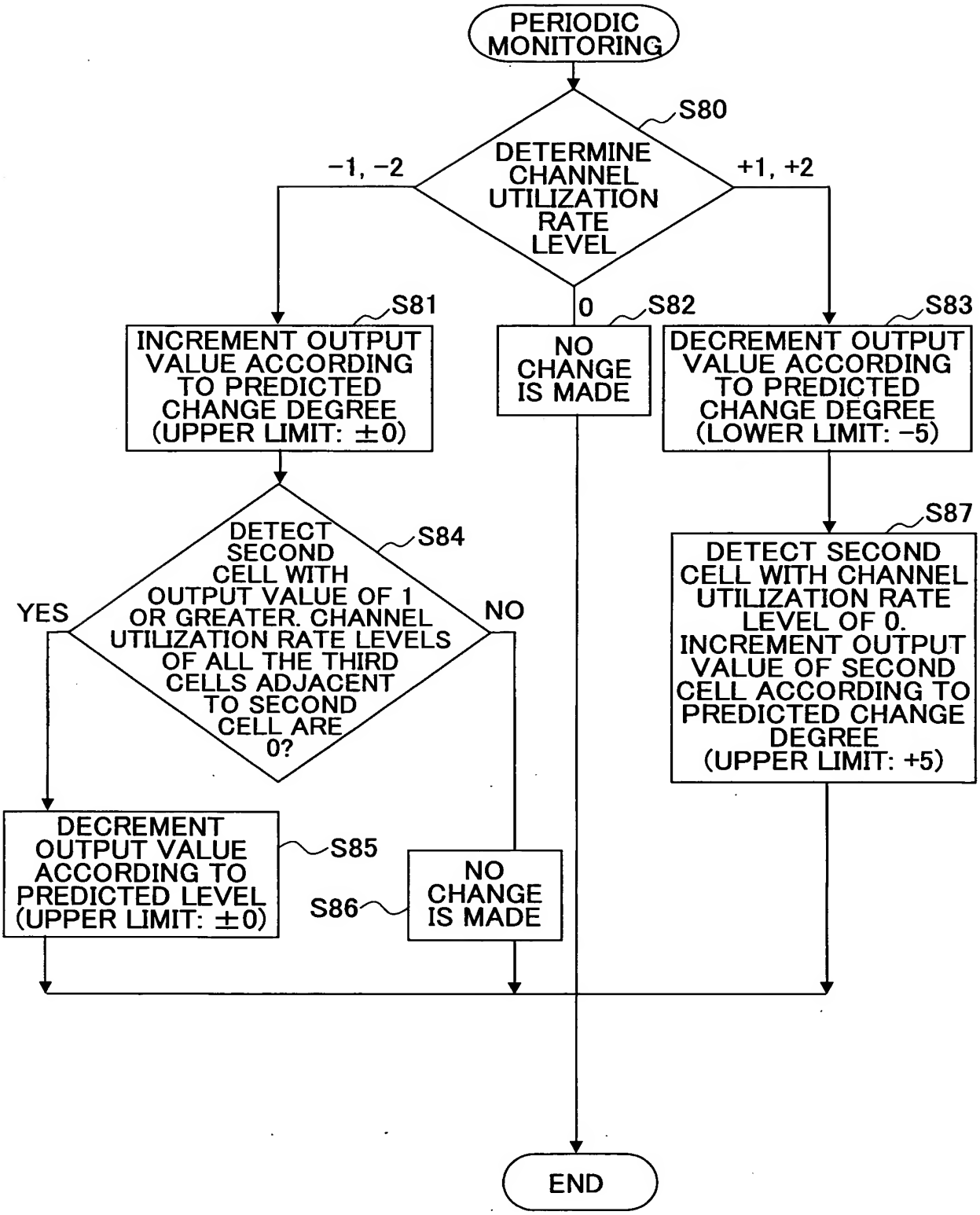
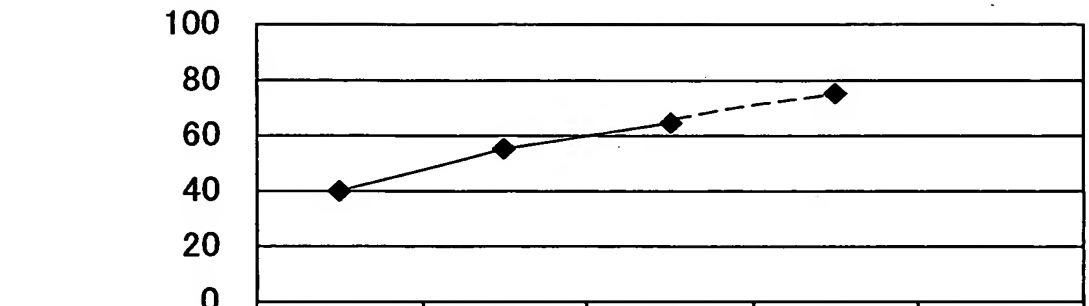
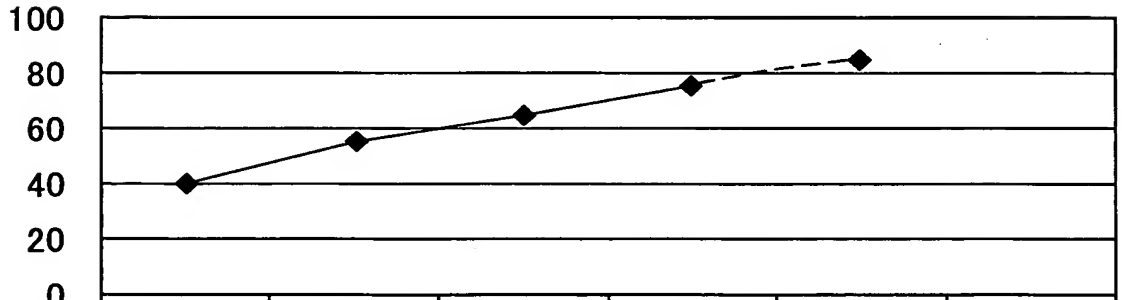

PERIODIC MONITORING
S80
DETERMINE CHANNEL UTILIZATION RATE LEVEL
−1, −2
0
+1, +2
S81
INCREMENT OUTPUT VALUE ACCORDING TO PREDICTED CHANGE DEGREE (UPPER LIMIT: ±0)
S82
NO CHANGE IS MADE
S83
DECREMENT OUTPUT VALUE ACCORDING TO PREDICTED CHANGE DEGREE (LOWER LIMIT: −5)
S84
DETECT SECOND CELL WITH OUTPUT VALUE OF 1 OR GREATER. CHANNEL UTILIZATION RATE LEVELS OF ALL THE THIRD CELLS ADJACENT TO SECOND CELL ARE 0?
YES
NO
S87
DETECT SECOND CELL WITH CHANNEL UTILIZATION RATE LEVEL OF 0. INCREMENT OUTPUT VALUE OF SECOND CELL ACCORDING TO PREDICTED CHANGE DEGREE (UPPER LIMIT: +5)
DECREMENT OUTPUT VALUE ACCORDING TO PREDICTED LEVEL (UPPER LIMIT: ±0)
S85
S86
NO CHANGE IS MADE
END

FIG.17



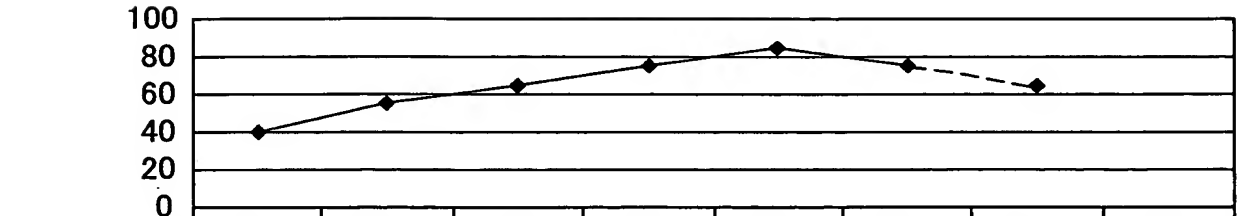
	t1	t2	t3	t4	t5
CHANNEL UTILIZATION RATE	40	55	65	75	

FIG.18



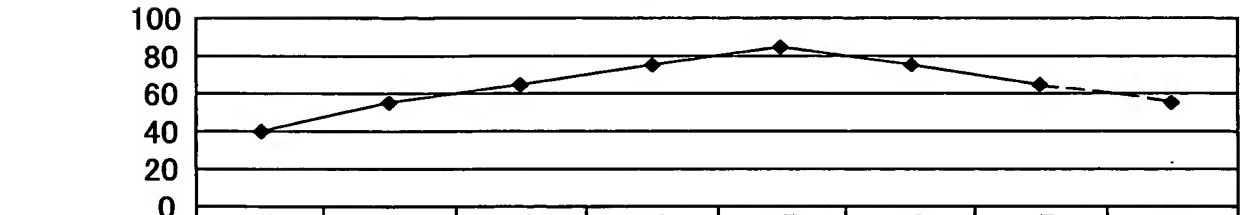
	t1	t2	t3	t4	t5	t6
CHANNEL UTILIZATION RATE	40	55	65	75	85	

FIG.19



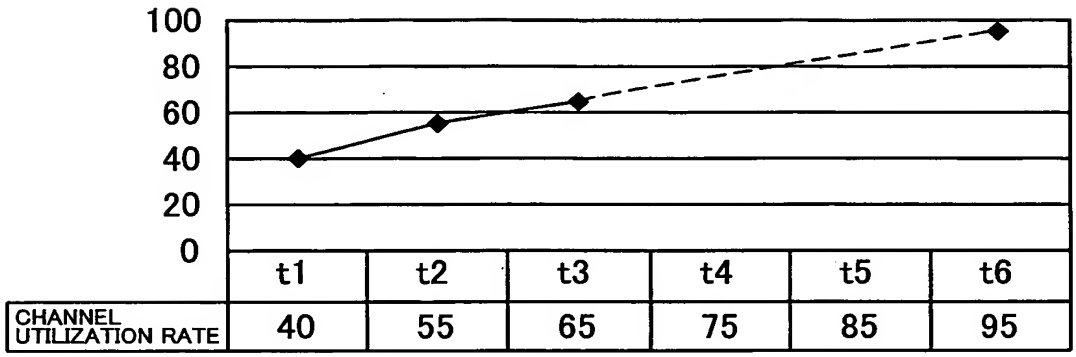
	t1	t2	t3	t4	t5	t6	t7	t8
CHANNEL UTILIZATION RATE	40	55	65	75	85	75	65	

FIG.20



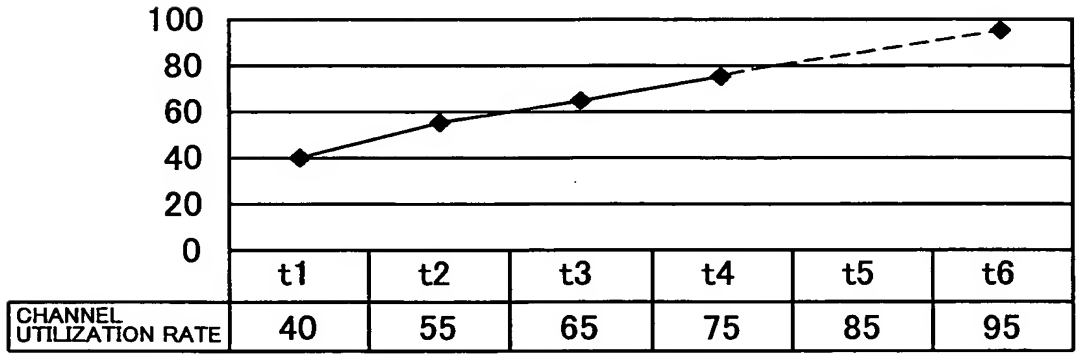
	t1	t2	t3	t4	t5	t6	t7	t8
CHANNEL UTILIZATION RATE	40	55	65	75	85	75	65	55

FIG.21



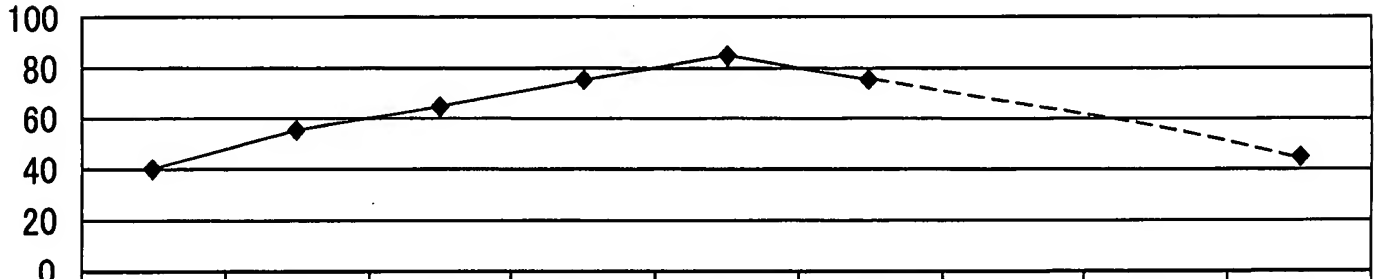
	t1	t2	t3	t4	t5	t6
CHANNEL UTILIZATION RATE	40	55	65	75	85	95

FIG.22



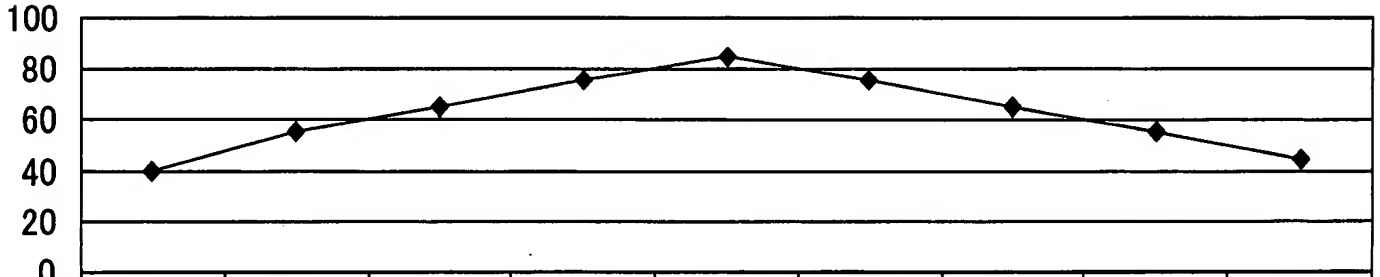
	t1	t2	t3	t4	t5	t6
CHANNEL UTILIZATION RATE	40	55	65	75	85	95

FIG.23



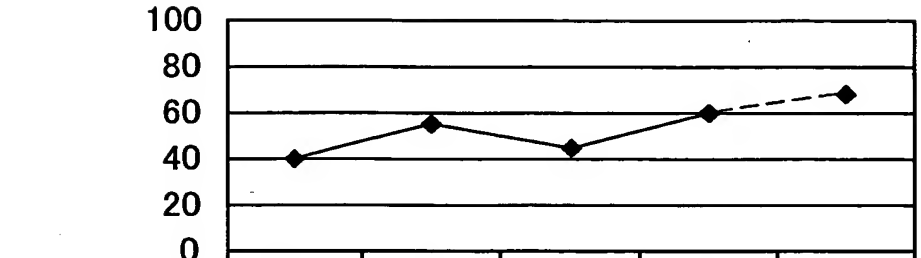
	t1	t2	t3	t4	t5	t6	t7	t8	t9
CHANNEL UTILIZATION RATE	40	55	65	75	85	75	65	55	45

FIG.24



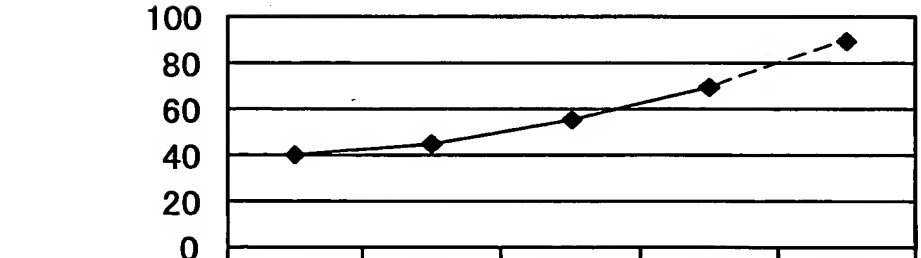
	t1	t2	t3	t4	t5	t6	t7	t8	t9
CHANNEL UTILIZATION RATE	40	55	65	75	85	75	65	55	45

FIG.25



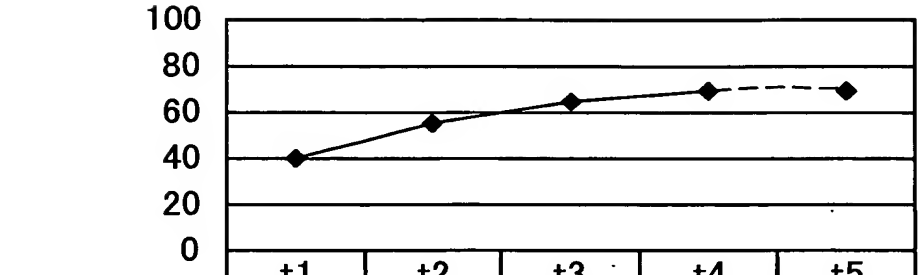
	t1	t2	t3	t4	t5
CHANNEL UTILIZATION RATE	40	55	45	60	68

FIG.26



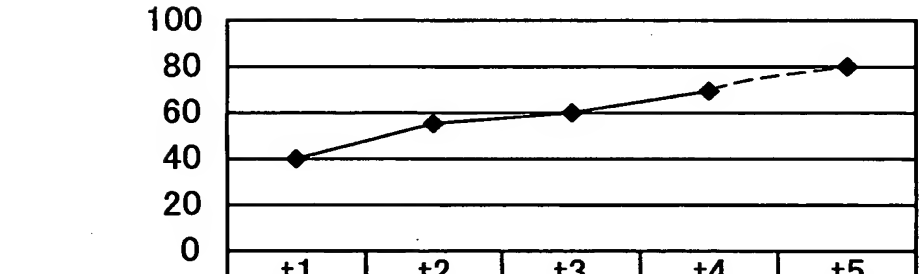
	t1	t2	t3	t4	t5
CHANNEL UTILIZATION RATE	40	45	55	70	90

FIG.27



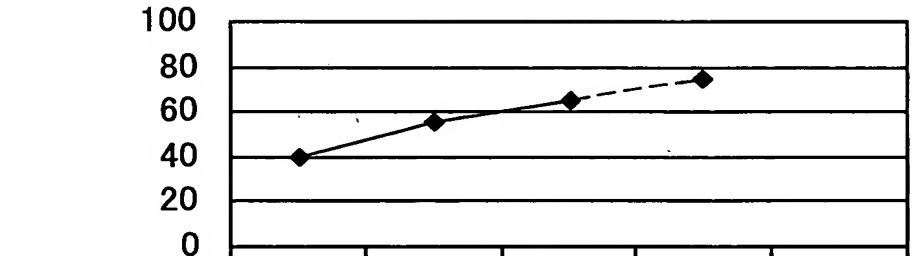
	t1	t2	t3	t4	t5
CHANNEL UTILIZATION RATE	40	55	65	70	70

FIG.28



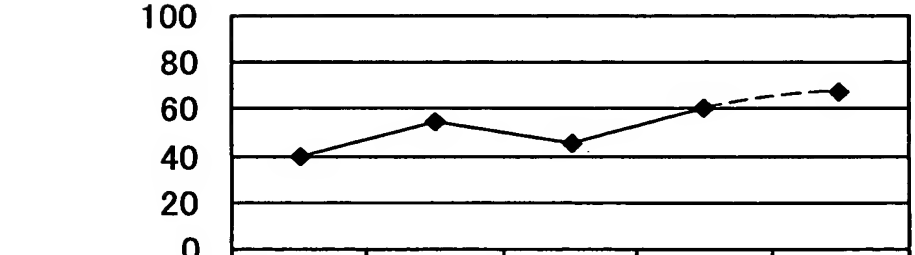
	t1	t2	t3	t4	t5
CHANNEL UTILIZATION RATE	40	55	60	70	80

FIG.29



	t1	t2	t3	t4	t5
CHANNEL UTILIZATION RATE	40	55	65	75	

FIG.30



	t1	t2	t3	t4	t5
CHANNEL UTILIZATION RATE	40	55	45	60	68

FIG.31

CELL NO.	CELL TRAFFIC INFO		
	PREDICTED LEVEL	PREDICTED CHANGE DEGREE	OUTPUT VALUE
1	1	0	0
2	0	0	+1
3	0	0	+1
4	2	+1	−1
5	0	0	+1
6	0	0	0
7	1	+1	0
8	0	0	+1
9	0	0	0
10	0	0	0
11	0	0	0
12	1	−1	0
:	:	:	:

FIG.32

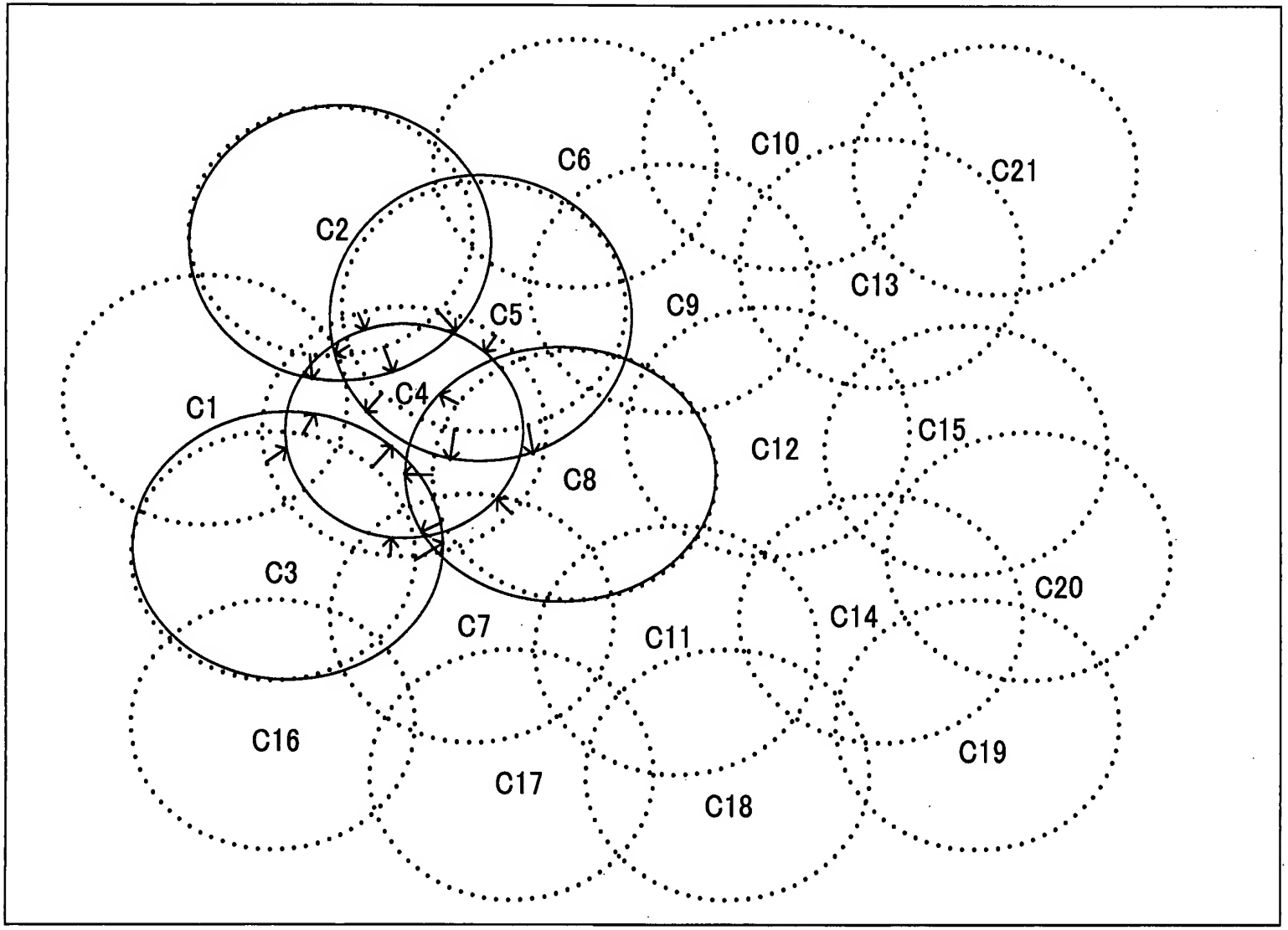

C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21

FIG.33

CELL NO.	CELL TRAFFIC INFO		
	PREDICTED LEVEL	PREDICTED CHANGE DEGREE	OUTPUT VALUE
1	1	0	0
2	0	0	0
3	0	0	0
4	0	−2	0
5	0	0	0
6	0	0	0
7	1	+1	0
8	0	0	+1
9	0	0	0
10	0	0	0
11	0	0	0
12	1	−1	0
:	:	:	:

FIG.34

CELL NO.	CELL TRAFFIC INFO		
	PRESENT LEVEL	PREDICTED CHANGE DEGREE	OUTPUT VALUE
1	1	0	0
2	0	0	+1
3	0	0	+1
4	0	+1	−1
5	0	0	+1
6	0	0	0
7	1	0	0
8	0	0	+1
9	0	0	0
10	0	0	0
11	0	0	0
12	1	0	0
:	:	:	:

FIG.35

CELL NO.	CELL TRAFFIC INFO		
	PRESENT LEVEL	PREDICTED CHANGE DEGREE	OUTPUT VALUE
1	1	0	0
2	0	0	0
3	0	0	0
4	2	−2	0
5	0	0	0
6	0	0	0
7	1	0	0
8	0	0	+1
9	0	0	0
10	0	0	0
11	0	0	0
12	1	0	0
:	:	:	: